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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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			EXAMINER	
			LEE, RIP A	
		ART UNIT	PAPER NUMBER	
		1713		

DATE MAILED: 05/27/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/744,904

Applicant(s)

TAKAHASHI ET AL.

Examiner

Rip A. Lee

Art Unit

1713

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1 and 3-77 is/are pending in the application.
- 4a) Of the above claim(s) 44-77 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 3-12 is/are allowed.
- 6) ☒ Claim(s) 13,29 and 34-43 is/are rejected.
- 7) ☒ Claim(s) 1,14-28,30-33,37,38 and 43 is/are objected to.
- 8) ☒ Claim(s) 1 and 3-77 are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date ____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____.

DETAILED ACTION

This office action follows a response filed on March 23, 2004. Applicants have amended claims 1 and 3-12. Claim 2 was canceled.

Claim Objections

1. Claim 1 is objected to because of the following informalities: Please change the temperature from 124 C to 135 °C.
2. Claims 15-28, 32, 33, 38, and 43 are objected to under 37 CFR 1.75(c) as being in improper form because a multiple dependent claim can not depend from another multiple dependent claim. See MPEP § 608.01(n). Accordingly, the claims 15-28, 32, 33, 38, and 43 have not been further treated on the merits.
3. Claim 23 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. The M_w/M_n range of 3-8 does not limit further the range 4.5-60 recited in independent claim 13.
4. Claim 37 is objected to because of the following informalities: The dependency of the claim needs to be changed since claim 37 can not depend from claim 33. Appropriate correction is required.

Claim Rejections - 35 USC § 112

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claims 34-38 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The equation needs to be corrected. It is believed that end parenthesis mark “) ” which appears after numeral 0.2 is extraneous; otherwise, the expression $4/(0.5 - 4.50/M_w/M_n) - 0.2$ may be simplified to $4/(0.3 - 4.50/M_w/M_n)$.

The format of the equation should be checked again. Currently, it appears as if M_z/M_w is greater than $[4/(0.5 - 4.50/M_w/M_n)] - 0.2$. Substituting the lower limit of M_w/M_n of 9.2, one obtains, $[4/(0.5 - 4.50/9.2)] - 0.2$, which simplifies to $[4/(0.5 - 0.489)] - 0.2$, which equals 363. This appears to be an exceedingly large lower bound for M_z/M_w .

7. Claims 39-43 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The description of the number of peaks and their relative intensities is meaningless since the GPC conditions are not established in the claim language. Since these parameters are critical to the resulting chromatographic features, they need to accompany the claim in order for the claim to be definite and not vague.

Claim Rejections - 35 USC § 102

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

9. Claim 13 is rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 5,798,305 to Horiuchi.

The prior art of Horiuchi teaches a polyethylene polymer having 0 – 1.5 methyl branches per 1000 carbon atoms and a M_w/M_n of 4.5 or less (claim 1). The polymer having a polydispersity index of 4.5 still meets the claimed product, and therefore, claim 13 is anticipated by the prior art.

10. Claim 29 is rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 5,260,384 to Morimoto *et al.*

Example 4 of Morimoto *et al.* discloses a polyethylene which displays a melt tension of 70, a swell ratio of 1.9, an intrinsic viscosity of 4.71 and MFR of 2.9. Since both equations (i_{A3}) and (ii_{A3}) are satisfied, the subject matter of claim 29 is anticipated by Morimoto *et al.*

Claim Rejections - 35 USC § 103

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

12. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

13. Claims 34-36 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patents No. 5,731,393 to Kojoh *et al.*, 6,294,631 to Brant, and JP 8-302083.

Comparative examples 2-4 of Kojoh *et al.*, Examples 16, 18, and 38 of Brant, and all examples in Table 1 of JP 8-302083 show polyethylenes having M_w/M_n values greater than 9.2. The accompanying M_z/M_w or M_z/M_n values are also tabulated in each reference. A reasonable basis exists to believe that said M_z/M_w values lie in the range specified in present claim 34, however, in light of the misprinted formula (see rejection under 35 USC 112, second paragraph in paragraph 6 of this office action), an exact determination of the claimed range is not possible. As such, the burden of proof is shifted to Applicants to establish an unobviousness difference, and since all parameters are shown, calculations should be facile.

In re Best, 562 F.2d 1252, 1255, 195 USPQ 430, 433 (CCPA 1977). *In re Spada*, 911 F.2d 705, 709, 15 USPQ2d 1655, 1658 (Fed. Cir. 1990).

Regarding claim 35, Example 1 of JP 8-302083 shows a polyethylene having a melt tension of 29, a swell ratio of 1.66, an intrinsic viscosity of 4.3 and MFR of 0.031. Based on these data, the skilled artisan would have found it obvious that the mathematical relationships recited in claims are satisfied. The patent is silent with respect to the actual value of Mw, however, in light of the fact that all equations of the present claims are satisfied, a reasonable basis exists to believe that the polymer of the prior art also exhibits the claimed relationship between swell ration and weight average molecular weight. Since the PTO can not perform experiments, the burden is shifted to the Applicants to establish an unobviousness difference. *In re Best*, 562 F.2d 1252, 1255, 195 USPQ 430, 433 (CCPA 1977). *In re Spada*, 911 F.2d 705, 709, 15 USPQ2d 1655, 1658 (Fed. Cir. 1990).

14. Claims 14, 30, and 31 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Allowable Subject Matter

15. The following is a statement of reasons for the indication of allowable subject matter: Upon correction of claim 1 to overcome the claim objection set forth in paragraph 1 of this office action, claims 1 and 3-14 would be allowed over the closest references, U.S. Patent No. 5,747,620 to Machida *et al.*, U.S. Patent No. 6,194,341 to Canich *et al.*, U.S. Patent No. 6,153,716 to Welch *et al.*

The present invention is drawn to an ethylene homopolymer or ethylene/C₄₋₂₀ α -olefin copolymer wherein (i) the methyl branches are less than 0.1 per 1000 C atoms as measured by ¹³C NMR spectroscopy, (ii) the molecular weight distribution, M_w/M_n is 1.8 – 4.5, and (iii) the intrinsic viscosity, $[\eta]$ (135 °C, decalin) is 0.2 – 18 dL/g.

Machida *et al.* teaches ethylene/C₃₋₂₀ α -olefin copolymers having a mole ratio of methyl groups to methylene groups [CH₃/CH₂] of 0.005 to 0.1, corresponding to 5 methyl groups per 1000 methylene groups. The molecular weight distribution, M_w/M_n , of copolymers lies in the range of 1.5 – 70, and the intrinsic viscosity, $[\eta]$ (135 °C, decalin) is 0.01 – 20 dL/g. The polymer does not have the requisite branching number of less than 0.1 per 1000 C atoms.

Canich *et al.* discloses an ethylene polymer with a molecular weight distribution, M_w/M_n , of 2.4 with no short chain branching as detected by ¹³C NMR spectroscopy. No information is provided regarding the intrinsic viscosity of the polymer, and since there is no supporting information in the text, one having ordinary skill in the art would not have found it obvious to believe that the prior art material would exhibit the claimed rheological property.

Welch *et al.* teaches ethylene/butene copolymers having a molecular weight distribution, M_w/M_n , of about 2 to 2.5 and having no detectable amounts of branches other than ethyl branches, as determined by ¹³C NMR spectroscopy. No information is provided regarding the intrinsic viscosity of the polymer, and since there is no supporting information in the text, one having ordinary skill in the art would not have found it obvious to believe that the prior art material would exhibit the claimed rheological property.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rip A. Lee whose telephone number is (571)272-1104. The examiner can be reached on Monday through Friday from 9:00 AM - 5:00 PM. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Wu, can be reached at (571)272-1114. The fax phone number for the organization where this application or proceeding is assigned is (703)872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <<http://pair-direct.uspto.gov>>. Should you have questions on the access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll free).

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May 17, 2004



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